General Education Annual Course Assessment Form

Course Number/Title ______ METR113 _______ GE Area ___________ R __________

Results reported for AY _______2018/19_________ # of sections ____1_____ # of instructors __1_

Course Coordinator: _______ Frank Freedman (lecturer) _______ E-mail: frank.freedman@sjsu.edu

Department Chair: _______ Sen Chiao ____________________________ College: ______ Science ________

Instructions: Each year, the department will prepare a brief (two page maximum) report that documents the assessment of the course during the year. This report will be electronically submitted to <curriculum@sjsu.edu>, by the department chair, to the Office of Undergraduate Studies, with an electronic copy to the home college by October 1 of the following academic year.

Part 1

To be completed by the course coordinator:

(1) What GELO(s) were assessed for the course during the AY?

Student Learning Outcome #3 (SLO3): “A student should be able to apply a scientific approach to answer questions about the earth and environment.”

(2) What were the results of the assessment of this course? What were the lessons learned from the assessment?

The department philosophy, instituted at a faculty retreat in January 2012, is to hold an “assessment week”, during which all GE classes would be assessed. In AY 2018-2019, this week was April 15-19.

The faculty prepared a series of questions to assess SLO#3 in the core GE class METR113. In all, the students were asked to provide four answers. First the students were given the following preface to the questions:

“Below are two diagrams (a) and (b) presented during earlier METR113 lectures.” Note: Each student got a copy of the two diagrams, which both illustrate air pollution concepts discussed in class are shown. Chart (a) showed air pollution impacts during normal vs. inversion conditions. Chart (b) showed a U.S. weather map showing a major high pressure center in the Eastern U.S.

Students were then asked four questions based on the charts: 1) Do temperature inversions tend to lead to high or low air pollution concentrations? 2) Briefly explain reasoning for answer to Q1. 3) Are high air pollution episodes typically associated with high or low pressure? 4) Briefly explain reasoning for answer to Q3.

The responses to the above questions were collectively graded based on a 4-pt scale:

1- Answered practically on questions correctly; exhibited little knowledge of subject
2- Answered some questions correctly; exhibited moderate knowledge of subject
3- Answered nearly all questions correctly; exhibited moderate-to-high knowledge of subject
4- Answered all questions correctly; exhibited high knowledge of subject
Assessment of knowledge of subject was based on student responses to questions 2 and 4, where the student had to explain aspects and interrelationships involving the data on the plot.

The following table shows student scores for each class section.

<table>
<thead>
<tr>
<th>Course Section</th>
<th>Score 4</th>
<th>Score 3</th>
<th>Score 2</th>
<th>Score 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>% of Total</td>
<td>7.7</td>
<td>46.2</td>
<td>38.5</td>
<td>7.7</td>
</tr>
</tbody>
</table>

The data clearly shows (see table) a clear bell-curve in results, with about 85% of students scoring “2” or “3” with equal percentages around this for worst (“1”) and best (“4”) scores. Overall, however, we would have liked a higher percentage of “4”s – only one student obtained this, answering all questions correctly and offering correct explanations.

Reading through student responses, in most cases students answered #1 and 2 correctly pertaining to the effects of temperature inversions on air pollution concentrations. Students expressed understanding of the how static stability aloft traps air pollutants underneath. Question 3 was the most problematic, with most students answering that low pressure systems lead to high air pollution, whereas the correct answer is the opposite. In many cases the reasoning offered in Q4 for their response to Q3 was logical although incorrect. For example students often answered that wind flows from high to low pressure (which is correct) and therefore traps air into low pressure centers (which is incorrect). Other times the student correctly saw that a low pressure system was in the southwestern U.S., which tends to be an area of high air pollution (e.g. Los Angeles) and therefore indicates low pressure leads to high air pollution (which is incorrect). In these instances we scored a “3” (assuming Q1 and 2 were correct) since the student exhibited reasoning skill.

The assessment shows good progress in students applying concepts of air pollution to meet SLO3 objectives.

(3) What modifications to the course, or its assessment activities or schedule, are planned for the upcoming year? (If no modifications are planned, the course coordinator should indicate this.)

a. No modifications to the course or assessment schedule are planned. Some modifications to assessment activities based on the results of assessment of SLO3 will be considered, as described in items below.

b. Based on this assessment, we will clarify the role of pressure systems and air quality, indicating that high pressure centers are most conducive to poor air quality and the reason why.

c. We will consider how to craft an assessment activity so that it carries some weight for the student grades so that the students take the assessment seriously. While most of the answers to this assessment appeared reasonably thought through, more thorough answers to better gauge assessment should result if graded coursework and assessment were directly linked. This is something we are planning throughout out our GE assessment courses (METR10, METR12, METR112, METR113 and METR115).

d. We will develop assessment questions about the role atmospheric chemistry and emissions plays on air pollution, as important of factors in determining air quality as meteorology.
Part 2

To be completed by the department chair (with input from course coordinator as appropriate):

(4) Are all sections of the course still aligned with the area Goals, Student Learning Objectives (GELOs), Content, Support, and Assessment? If they are not, what actions are planned?

The chair is satisfied that this course is being delivered with full and appropriate attention to all Area B Goals, SLOs, Content, Support and Assessment.

(5) If this course is in a GE Area with a stated enrollment limit (Areas A1, A2, A3, C2, D1, R, S, V, & Z), please indicate how oral presentations will be evaluated with larger sections (Area A1), or how practice and revisions in writing will be addressed with larger sections, particularly how students are receiving thorough feedback on the writing which accounts for the minimum word count in this GE category (Areas A2, A3, C2, D1, R, S, V, & Z) and, for the writing intensive courses (A2, A3, and Z), documentation that the students are meeting the GE GELOs for writing.

Feedback on writing is given to students after each assignment, with suggestions on how to improve. A noteworthy feature is that students tend to do well when there is a focused assignment (e.g. limiting wordiness), but not quite so well when they have to put it together in a longer assignment.